



Third United Nations
International Conference
on the Peaceful Uses
of Atomic Energy

A/CONF.28/A/678

SPAIN

February 1964

Original: SPANISH

Confidential until official release during Conference

Abstract

SOME APPLICATIONS OF THE PULSED NEUTRON SOURCE TECHNIQUE

F. Verdaguer, F. Cordero, B.G. Castañer, E.R. Mayquez, M.A. Vigón
Junta de Energía Nuclear. Madrid

In this paper we present some applications of the pulsed neutron source technique, the results obtained and the measurements in progress.

A 600 Kv Cockroft-Walton accelerator has been used as a neutron source. The neutrons bursts are obtained pulsing a Penning type ion source.

The first measurements have been performed with a 9 channels time analyser, but, at present, it is in use a new 256 channels transistorized instrument.

First, the diffusion parameters of light water have been measured. The results agree with the published ones.

The connection between the cooling effect coefficient, c , and the mean square energy transfer, M_2 , suggested the possibility to perform a measurement of M_2 through the perturbations which are produced on the capture and diffusion constant of non- $1/v$ capturing media. This media have been obtained dissolving different amounts of cadmium in light water. Those perturbations depends on the cadmium concentration, on the temperature dependence of the effective cross-section of cadmium and on M_2 . From this measurements a value, $M_2 = 1,65 \pm 0,49 \text{ cm}^{-1}$, is deduced.

Previous results from measurements of the diffusion para-
Translation provided by courtesy of the submitting Government

meters of Santowax-R in function of the temperature are, also, presented. To calibrate the experimental set up used, measurements have been performed in which Gilotherm substitutes Santowax-R.

With regard to non-multiplying media, measurements are in progress to study the effect produced by a reflector on the mean life of neutrons in moderators.

In order to apply the pulsed neutron source technique to multiplying media, a 150 Kv pulsed accelerator has been built. The firsts measurements will be performed on a heavy water moderated subcritical assembly and with two different kinds of fuel elements. Uranium oxide and uranium carbide organic cooled fuel elements. The measurements will be performed at ambient temperature. This subcritical assembly is described in another paper to be presented to this Conference, relative to measurements with stationnary neutron sources.